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October 3, 1995

TO: Dr. Elaine Gallin

TELE NO: FAX NO: 301-903-1413

FROM: William L. Robison   TELE NO: (510) 422-3840

SUBJECT: Palomares

MESSAGE: See enclosed.

We are transmitting 05 page(s) (including this cover sheet). If the transmittal is not complete, please phone (510) 422-3885.

Lawrence Livermore National Laboratory

HEALTH & ECOLOGICAL
ASSESSMENT DIVISION

October 3, 1995

Dr. Elaine Gallin, EH-63
U.S. Department of Energy
Office of International Health Studies
Washington, DC 20585

Dear Elaine:

Enclosed is another copy of the major tasks as we see them for our joint work with CIEMAT at Palomares. Also, enclosed are budget estimates for the tasks and a breakdown for distributing the costs over three fiscal years (FY 1996, 1997, and 1998).

I have proposed a minimum budget of $30K for the out years to continue our contact with, and provide consultation to, CIEMAT on the Palomares Pu issues.

If you need further information, please call or FAX me (phone (510) 422-3840; FAX (510) 423-6785).

Best regards,

William L. Robison
Division Leader

WLR:rb
Enclosure

PALOMARES RESEARCH NEEDS

The purpose of the past and current Palomares studies is to assess the Pu source term of exposure to residents of Spain in the vicinity of the 1966 non-nuclear explosion of two nuclear weapons dropped during a mid-air collision. The LLNL 1993 study intended to supplement and assist the efforts of the Spanish national laboratory, Centro de Investigaciones Energeticas Medioambientales y Tecnologicas (CIEMAT), and was especially important in view of recent actions by the EPA to set standards for transuranic contaminants in soil. In 1993, we exhanged visits of analytical facilities with CIEMAT, exchanged Quality Assurance Standard Samples, and collaborated in a special resuspension study near the ground zero of Area 2 to evaluate the inhalation pathway.

LLNL experience there has identified important areas of potential research:

1) The specific Pu-activity of suspended particulates relative to the soil Pu-specific activity was much lower than expected in preliminary estimates. The significance of this is that one could greatly overestimate inhalation exposures, and otherwise bias the risk assessments to recommend unnecessary remedial action. The problems are that the study site near the ground zero in Area 2 may not be representative of the downwind deposition pattern, very little is known about Area 3, and CIEMAT air monitoring data cannot be used to estimate this variable. The research need is to conduct short term, simultaneous Pu-specific activity measurements down the centerline of the old deposition patterns in both Areas 2 and 3, and especially in sites of intense agriculture where farm workers may be exposed to high suspended dust levels. The results should be used in a regional area health risk assessment.

2) The invisible plume of suspended Pu-particulates may drift in directions not adequately monitored at present. The climate and topography of Palomares is complicated, and we found distinctly different air flow regimes due to the influence of the sea breeze and terrain. The problem is that the current air monitoring is placed at locations of historical interest, and no attempt has been made to model the plume drift as influenced by local airflow regimes; CIEMAT air modeling is limited, and not addressing this practical application at present. The research need is to use the CIEMAT weather station data, climatology, and local topography data to initialize model calculations of the complex flow regime using a 3-dimensional model such as MATHEW-ADPIC. The results would be used to identifly candidate areas of potential air monitoring in both Areas 2 and 3, to determine if the historical air monitoring is truly the bounding case for health risk assessments, and to assist CIEMAT in their own model applications, as well as to perform a regionally valid health risk assessment.

COST ESTIMATES FOR PROPOSED PALOMARES STUDY:

FY 1996

Task 1. Finish analysis and report of results for 1993 study.

Complete radiochemistry, combined samples: 20 @ $0.6Kea = $12K
Complete report, 2 FTE X 2 months @ $15K/FTE-month = $60K
                                                  Total = $72K

Task 2 (1996). Conduct field study of Area 2, along deposition centerline.

Prepare for field study, 2 FTE X 3 weeks @ $15K/FTE-month = $ 23K
Operate 10 air samplers, 4 FTE X 3 weeks @ $15K/FTE-month = $ 48K
Travel and per diem, 4 FTE @ $3K for 3 weeks = $ 12K
Complete radiochemistry: 20 samples @ $0.6K ea = $ 12K
Prepare report: 1 FTE X 6 weeks @ $15K/FTE-month = $ 23K
Intercalibration exercise: 10 samples @ 0.6K ea $ 6K
                                                  Total = $124K

FY 1997

Task 2 (1997). Conduct field study of Area 3, along deposition centerline

Prepare for field study, 2 FTE X 2 weeks @ $15K/FTE-month = $ 15K
Operate 10 air samplers, 4 FTE X 3 weeks @ $15K/FTE-month = $ 48K
Travel and per diem, 4 FTE @ $3K for 3 weeks = $ 12K
Complete radiochemistry: 20 samples @ $0.6K ea = $ 12K
Prepare report: 1 FTE X 6 weeks @ $15K/FTE-month = $ 23K
Intercalibration exercise: 10 samples @ 0.6K ea $ 6K
                                                  Total = $116K

Task 3. Determine plume distribution and downwind exposures with model.

Conduct modeling, 2 FTE X 4 weeks @ $15K/FTE-month = $30K
Validate-use existing data, 2 FTE X 4 weeks @ $15K/FTE-month = $30K
                                                  Total = $60K

The total cost listed for Palomares Tasks 1, 2, and 3 can be distributed into three fiscal years as follows:

FY 1996

Task 1—$72K
Task 2—$83K (The radiochemistry, intercalibration exercise, and report
can be done in FY1997)

      Total—$155K for FY 1996

FY 1997

1996 Task 2 carryover—$41K (Radiochemistry, intercalibration exercise,
and report from 1996 Task 2)

Task 2 1997—$75K (The radiochemistry, intercalibration exercise, and
report can be done in FY 1998.)

      Total—$116K for FY 1997

FY 1998

1997 Task 2 carryover—$41K (Radiochemistry, intercalibration exercise,
and report from 1997 Task 2.)

Task 3—$60K

      Total—$101K

FY 1999 to FY ??

Consultation with Spanish Group (CIEMAT)—$30K per year.
(Joint planning meeting, intercalibration exercise, data
interpretation, model development, etc.)